



Genes encoding sterol delta-14 reductase in plants

Description of Technology: This invention is in the field of plant molecular biology. More specifically, this invention pertains to nucleic acid fragments encoding sterol delta-14 reductase in plants and seeds.

Patent Listing:

1. **US Patent No. 7,009,089**, Issued March 7, 2006, "Genes encoding sterol delta-14 reductase in plants"

<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F7009089>

Market Potential: Sterols are cyclic hydrocarbon molecules that help regulate the fluidity of cellular membranes. Sterols are essential components in all eukaryotic cells, and inhibitors that completely block sterol synthesis will block cell division and generally lead to cell death. In humans the predominant membrane sterol is cholesterol, which serves its structural role in membranes, and also serves as the precursor to hormones, bile salts, and modified membrane components. In fungi, the predominant sterol is often ergosterol, which follows the same biosynthetic pathway as cholesterol but contains an additional methyl group and altered double-bond placements. In plants there are multiple sterols working in different combinations, with stigmasterol and sitosterol as the most common components. The plant sterols tend to have 29 carbons, versus the 28 carbons of ergosterol, and the 27 carbons of cholesterol, but all are synthesized from the common precursors squalene and lanosterol.

Prior to the instant invention, no plant sterol delta-14 reductase genes have been isolated. Availability of such plant genes will enable one to alter sterol production and/or composition in plants, to identify compounds that may be used as novel herbicides and fungicides, and to identify mutants of these genes that are resistant to these herbicides that will enable the production of herbicide-resistant crops.

Benefits:

- Alters sterol production and composition in plants

Applications:

- Herbicides and fungicides

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